WHAT IS CLAIMED IS:

1. A method for determining an interaction between a plurality of molecules, comprising:

(a) flowing a plurality of molecules in a fluidic conduit;

(b) measuring the dispersion of at least one of the molecules, wherein the dispersion of the molecules is Taylor-Aris dispersion, and

(c) relating the dispersion to the interaction between the plurality of molecules.

2. The method of claim 1, wherein the molecules are subjected to pressure- driven flow.

3. The method of claim 1, wherein the dispersion of the at least one molecule is compared with the dispersion of each of the plurality of molecules in the absence of the other molecules.

4. The method of claim 1, wherein the dispersion is measured by detecting the concentration of the molecules in the fluidic conduit.

5. The method of claim 4, wherein the molecules are not labeled for detection.

6. The method of claim 1, wherein the interaction is an associative interaction.

7. The method of claim 6, wherein the molecules comprise a ligand and a receptor.

8. The method of claim 1, wherein the interaction is a dissociative interaction.

9. The method of claim 1, wherein the plurality of molecules are selected from the group consisting of amino acids, polyamino acids, nucleotides, polynucleotides, saccharides, polysaccharides, antibodies, receptor proteins, signal proteins, enzymes, cofactors, cytokines, hormones, chemokines, polymers and drugs.

10. The method of claim 1, wherein a diffusivity ratio of two of the molecules is at least about 2.

11. A method for determining an interaction between a plurality of molecules, comprising:

(a) introducing a first molecule of a plurality of molecules into a microfluidic conduit;

(b) introducing a second molecule of the plurality of molecules into the microfluidic conduit;

(c) measuring the dispersion of at least one of the first and second molecules flowing in the microfluidic conduit under pressure-driven flow conditions; and

(d) relating the dispersion to the interaction between the plurality of molecules.

12. The method of claim 11, wherein the first molecule is introduced into the microfluidic conduit in a continuous stream of fluid.

13. The method of claim 11, wherein the second molecule is introduced into the microfluidic conduit in a bolus of fluid.

14. The method of claim 11, wherein the first and second molecules are introduced simultaneously.

15. The method of claim 14, wherein the first and second molecules are pre- mixed and introduced as a bolus of fluid.

16. The method of claim 11, wherein the first and second molecules are in fluid communication.

17. The method of claim 11, wherein the dispersion is measured by detecting the concentration of the molecules.

18. The method of claim 17, wherein the detection is by fluorescence, absorbance spectroscopy, thermal lens spectroscopy, or UV spectroscopy.

19. The method of claim 17, wherein the detection is by mass spectroscopy, an electrochemical technique, a magnetic resonance technique, or radioactive technique.

20. The method of claim 11, wherein the dispersion of the first molecule is compared to the dispersion of the first molecule flowing in the microfluidic conduit in the absence of the second molecule.

21. The method of claim 11, wherein the dispersion of the second molecule is compared to the dispersion of the second molecule flowing in the microfluidic conduit in the absence of the first molecule.

22. The method of claim 11, wherein a diffusivity ratio of two of the plurality of molecules is at least about 2.

23. The method of claim 22, wherein the diffusivity ratio is about 8-10.

24. The method of claim 22, wherein the diffusivity ratio is greater than 10.

25. The method of claim 11, wherein the interaction is an associative interaction.

26. The method of claim 11, wherein the interaction is a dissociative interaction.

27. The method of claim 11, wherein the plurality of molecules are selected from the group consisting of amino acids, polyamino acids, nucleotides, polynucleotides, saccharides, polysaccharides, antibodies, receptor proteins, signal proteins, enzymes, cofactors, cytokines, hormones, chemokines, polymers and drugs.

28. The method of claim 11, wherein the molecules comprise a receptor and a ligand.

29. The method of claim 11, wherein the molecules comprise an enzyme and a substrate.

30. The method of claim 11, further comprising introducing one or more additional molecules into the microfluidic conduit, and measuring the dispersion of the one or more additional molecules flowing in the conduit.

31. The method of claim 11, wherein measuring the dispersion comprises measuring longitudinal dispersion in the axis of flow.

32. The method of claim 11, wherein the first and second molecules do not flow in side-by-side streams.

33. A microfluidic system, comprising:

a microfluidic device having a body structure including a first channel and a second channel formed therein, wherein the first and second channels intersect;

a fluid sample inlet through which a sample is delivered to the first channel and the second channel;

a first fluid reservoir in fluid communication with the first channel, the first channel having an inlet through which a first fluid is delivered from the first reservoir to the first channel;

a second fluid reservoir in fluid communication with the second channel, the second channel having an inlet through which a second fluid is delivered from the second reservoir to the second channel;

a first detection zone in the first channel disposed downstream of the fluid sample inlet and the first fluid inlet and a second detection zone in the second channel disposed downstream of the fluid sample inlet and the second fluid inlet; and

means for determining a relative dispersivity of at least one molecule in fluid flowing through the first and second detection zones.

34. The system of claim 33, wherein the sample inlet is coupled to a source of a sample fluid.

35. The system of claim 33, wherein the first detection zone and the second detection zone each comprise a detector that measures the concentration of at least one molecule of the fluid flowing in the first channel and the second channel.

36. The system of claim 35, wherein the concentration is measured by fluorescence, absorbance spectroscopy, thermal lens spectroscopy, or UV spectroscopy.

37. The system of claim 35, wherein the concentration is measured by mass spectrometry, an electrochemical technique, a magnetic resonance technique, or radioactive technique.

38. The system of claim 33, further comprising means for inducing pressure-driven flow of fluid in the first and second channels.

39. The system of claim 38, wherein the first reservoir contains a protein solution and the second reservoir contains a buffer solution.

40. The system of claim 39, wherein a fluid containing a sample molecule is introduced through the sample inlet into the first channel and the second channel; the protein solution is introduced into the first channel; and the buffer solution is introduced into the second channel; and

wherein the fluid containing the sample molecule is mixed with the protein solution in the first channel and the buffer solution in the second channel.

41. The system of claim 40, wherein the concentration of the sample molecule is measured in the detection zones of the first and second channels.

42. The system of claim 40, wherein a diffusivity ratio of the sample molecule to the protein is at least about 2.

43. The system of claim 42, wherein the dispersion of the sample molecule in the first channel and second channel is determined and compared to determine an interaction between the sample molecule and the protein.

44. A microfluidic system comprising:

a microfluidic device having a body structure including a first channel and a second channel formed therein;

means for introducing a first fluid containing at least a first molecule into the first channel;

means for introducing a second fluid containing at least a second molecule into the second channel;

means for introducing a fluid containing one or more test molecules to both the first channel and the second channel;

means for inducing pressure-driven flow of the first fluid, the second fluid, and the fluid containing the one or more test molecules in the first and second channels;

means disposed in the first channel and the second channel for determining the dispersion of at least one of the first molecule, second molecule, or test molecule; and

means for relating the dispersion to an interaction between two or more of the test molecule, the first molecule, and the second molecule.

45. The system of claim 44, wherein the determining means detects the concentration of one or more of the first, second, or test molecules in the first and second channels.

46. The system of claim 44, wherein a diffusivity ratio of the test molecule to at least one of the first or second molecules is greater than about 2.

47. The system of claim 44, wherein the first fluid is a solution containing a protein molecule, the second fluid is a solution containing a molecule that does not interact with the first molecule or said one or more test molecules, and said one or more test molecules is a molecule being tested for an interaction with the protein molecule.

48. The system of claim 44, wherein the first fluid is a solution containing a protein molecule, the second fluid is a solution containing a ligand known to interact with the protein molecule, and said one or more test molecules is a molecule being tested for an interaction with the protein molecule in the presence of the ligand.

49. The method of claim 1, wherein at least a portion of the fluidic conduit contains a sieving matrix.

50. The method of claim 49, wherein the sieving matrix comprises a gel.